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ASSESSMENT OF WORKPLACE WRITING AND INCORPORATION INTO CURRICULUM

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Employers expect entry-level employees in technical fields to possess excellent communication skills. The authors reviewed relevant literature and conducted a survey of technical Bachelor of Science degree graduates who had taken technical writing, in order to determine the usefulness of various course topics to their employment and the types of writing skills needed in the workplace. Memos and business letters were written by 83.7% and 80.0% of the graduates respectively, proposals by 62.1%, progress reports by 57.3%, and procedural manuals by 48.9%. Executive summaries were written more often (35.1% of the time) than abstracts (21.9%). The course was rated as very useful to employment by 89.4%. The authors summarize topics that an English composition course may not include but which were desired to meet workplace needs. Recommendations are given for incorporating these topics into existing curriculum.

Mastery over communication skills is generally recognized by researchers as an essential prerequisite for employees who hope to succeed in business and industry. Andrews and Andrews (1992), commenting on the challenges of business communication in the global economy, emphasized that good communication skills

will be far more important to business and personal success in the 21st century than it has been in the 20th century because communication will be central to everything we do. Barclay, Pinelli, Keene, Kennedy, and Glassman (1991) asserted that "the ability to communicate technical information effectively is important to workplace performance and professional advancement" (p. 330), and Anderson (1991) maintained that writing effectively can bring an employee many personal benefits, including "recognition in the form of praise, raises and promotions" (p. 5). Yet, a common complaint by employers in business and industry is that entry level employees lack adequate communication skills to perform effectively on the job. For example, General Dynamics and other aerospace firms have expressed concern that "a growing number of entry level engineers cannot write reports, fail to make effective presentations of their ideas or concepts, and find it difficult to communicate with peers" (Kandebo, Phillips, & Kernstock, 1991, p. 46).

Lesiker, Petit, and Darsey (1993) stressed the vital role technical communication plays in business and industry, emphasizing that "communication is the ingredient that makes organizations possible," and that "virtually all actions taken in an organization [are] preceded by communication." Yet, all too often, "communication in business is done poorly" (p. 6). Poor communication skills cost companies money because of misunderstandings, reorders, and duplication of efforts. Kaeter (1993) pointed out an example that occurred at Wacker Siltronic, a multi-national corporation: "poor documentation was the direct cause of faulty production runs several times a week" (p. 22). Conversely, a competitive edge is enjoyed by companies whose production-level employees clearly, concisely, and forcefully get their message across. When ordering supplies, monitoring local market changes, and responding to customers' concerns, employees need excellent communication skills to serve their companies well.

Technical writing programs have been under severe attack and scrutiny by researchers, for the communication deficiency of technical workers. Barclay, et al (1991) argued that if academic programs are to achieve their goals of preparing skilled technical writers, the programs must reflect workplace culture, organization, and communications at the national and international levels. The authors perceived problems occurring when technical writing teachers have "neither participated in nor fully understood the communication process in the workplace" (p. 325). Hence, they remain unaware of the cultural and organizational constraints that influence communication habits/practices in the workplace and rely instead on "teaching the textbook." Odell, Goswami, Herrington, and Quick (1983) argued that such teaching ("teaching the textbook") reflects a disparity between the classroom and the workplace as "textbooks are often derived from other textbooks, and teachers of writing tend to reflect the values of their own teachers rather than their understanding of what writers actually do" (p. 17). Anderson (1985) suggested that teachers of career-related writing can gain important insights into ways to design their courses by understanding and learning the "purposes of workers at work try to achieve, the expectations and conventions that pertain to writing at work, the features that distinguish communications that succeed in that environment, and the composing processes writers customarily rely on there" (p. 75).

Anderson (1985) recommended certain strategies that teachers can employ to enable students to appreciate the need for good writing skills. Teachers can explain to students the important role writing plays in the students' careers regardless of major, and that writing must be clear, concise, and well-organized as well as grammatically flawless. Students can be provided with instruction and practice in writing for a variety of audiences as well as instruction and practice in writing various forms of written communication.

To avoid incongruencies between the types of writing done in the classroom and the types of writing expected on the job, the authors of this article surveyed past technical graduates of the College of Technical Careers (CTC) at Southern Illinois University at Carbondale who had taken the junior/senior level CTC technical writing course. Types of writing and skills that need to be developed for the workplace were investigated. The article presents the authors' findings and highlights several topic areas that ought to be incorporated into curricula to ensure proficiency in on-the-job communication skills.

Results of Survey on Workplace Writing

A survey was conducted of graduates who had taken a junior/senior level technical writing courses entitled

"Applications of Technical Information." Of 136 surveys returned and analyzed, 91.1% indicated full-time employment, 4.4% part-time, 1.5% seeking employment, and 2.2% did not respond to the employment question. Years on-the-job after graduation ranged from one to six years. All of these Bachelor of Science graduates also had associate of applied science degrees or equivalent in technical fields. Their technical backgrounds were as follows: Automotive Technology (19%), Architecture Technology (18%), Computer Information Processing (13%), Construction Technology (7%), Dental Technology (6%), Commercial Graphics (4%), Office Systems (4%), Law Enforcement (3%), Avionics (3%), and with the following majors representing less than 2.5%: Tool and Manufacturing, Mortuary Science, Electronics Technology, Aviation Maintenance Technology, Photographic Production Technology, Business Management, Marketing, Applied Technology, Heating and Refrigeration, or general studies. Invalid or no responses comprised 3.68%.

On a Likert scale of 1-5, graduates were asked to rate how useful this course is to their employment with 1 being "not useful" to 5 being "very useful." A mean of 3.62 with standard deviation of 1.0 was obtained. Of these graduates, 89.4% rated this course useful or very useful. This varies from the opinion many students shared at the beginning of course stating they did not think that they needed a technical writing course because they have had English composition. When talking to graduates, many admit that as students they did not think they would be doing so much writing on the job and they did not realize how important writing is to their employment. Also, many (as students) thought they would have a secretary write and type for them but instead found that they were expected to do most of their own writing on a computer.

In our survey, we listed various writing techniques and asked how useful graduates felt these techniques are for performing effectively on the job. Table 1 shows the means, standard deviation, and rank order by mean of writing techniques from high to low.

Table 1
Usefulness of Specific Writing Techniques

Technique	Mean	SD	% Useful or Better
Writing clearly and succinctly	4.13	.900	96.2
Writing grammatically correct English	4.07	1.028	94.7
Giving oral presentations	3.80	1.182	85.6
Incorporating data in reports	3.62	1.180	83.2
Documenting appropriately	3.62	1.215	80.8
Composing purpose statements	3.59	1.028	88.4
Adjusting writing to audience	3.59	1.105	86.9
Writing/editing with word processing	3.47	1.383	72.8
Incorporating graphics in report	3.35	1.205	76.9
Preparing arguments	3.20	1.186	70.4
Studying rhetorical strategies	3.17	1.195	69.2

Evaluating peer's or subordinate's writing	3.13	1.164	72.3
Performing library research	3.01	1.344	65.6
Experiencing group writing projects	2.82	1.292	58.7

Graduates were asked to rate usefulness on a five-point scale, 1 being not useful to 5 being very useful. The last column of this table indicates which items students rated as useful, a 3 or higher being interpreted as useful. Note that 58.7% still felt that even the lowest ranked item was useful. Those items ranked highest (with 80% or more feeling these were useful) were writing clearly and succinctly, writing grammatically correct English, giving oral presentations, incorporating data, documenting appropriately, composing clear purpose statements and adjusting writing to audience.

Our survey also asked if the types of writing identified in Table 2 are performed on the job, and, if so, how often. Types of writing are listed in Table 2 in rank order.

Table 2
Types of Writing Performed on the Job by Technical Graduates

Type of Writing	Not Per-formed	Yes, Daily	Yes, Weekly	Yes, Monthly	Yes, Yearly	Yes, (freq. not Indicated)	Total % Yes
Memos	16.3	22.2	42.2	15.6	3.0	.7	83.7
Business Letters	20.0	11.9	34.1	28.9	5.2	0	80.0
Proposals	37.9	6.1	9.1	30.3	15.2	1.5	62.1
Progress Reports	42.7	2.3	17.6	25.7	9.2	.8	57.3
Procedural Manuals	51.1	3.8	4.5	10.5	30.1	0	48.9
Executive Summaries	64.9	2.3	5.3	13.7	13.0	.8	35.1
Financial Reports	73.5	2.3	5.3	10.6	7.6	.8	26.5
Research Reports	76.3	2.3	.8	10.7	9.2	.8	23.7
Feasibility Studies	76.9	0	.8	10.0	10.8	1.5	23.1
Abstracts	78.1	.8	5.5	7.8	7.8	0	21.9

Marketing Reports	85.5	1.5	1.5	8.4	3.1	0	14.5
Laboratory Reports	92.4	1.5	3.0	2.3	.8	0	7.6

Not surprisingly, most graduates wrote memos and letters, (83.7 and 80.0% respectively). Executive summaries are written more often (35.1% of the time) than abstracts (21.9%). The types of reports written most often were proposals (62.1%), progress reports (57.3%), and procedural manuals (48.9%). Financial reports were written by 26.5% of respondents, research reports by 23.1%, and feasibility studies by 23.1%. Laboratory (7.6%) or marketing reports (14.5%) were not written as often by these technical graduates.

Table 3 shows skills we felt that an English composition course may not include but which were desired to meet employer preferences.

Table 3
What English Composition May Not Teach But Business/Industry Desires

1. Business Correspondence
2. Writing courteously to customers and others
3. Adjusting from technical audience to others
4. Writing executive summaries
5. Incorporating graphics
6. Using listing and information tables (Classification/Division)
7. Incorporating signs, symbols, formulas, dimensions appropriately
8. Composing clear purpose statements
9. Utilizing no-nonsense, concise, specific writing
10. Being objective, not subjective or emotional
11. Defining terms and preparing glossaries
12. Describing process or mechanism descriptions
13. Arguing logically
14. Gathering information by interviewing or surveying
15. Writing proposals for acceptance
16. Writing progress reports
17. Writing procedures/instructions (using active voice/imperative mood)
18. Reporting research/empirical results
19. Writing feasibility reports

The survey results were helpful in deciding which topics to include in our technical writing course and which topics needed most attention. Also in a college seminar we recommended that two-year technical programs incorporate some of these ideas into their existing course work. The following is a listing and brief discussion of these topics.

Topics Recommended for Workplace Writing

The following is a combination of the types of writing performed on the job and some useful writing techniques to help employees create quality workplace documents.

Audience and Purpose

Document readability comes from an awareness of the intended audience and a sense of purpose. Reep (1994) identified reader, purpose and writing situation as the most important organizing principles that shape the content and presentation. Important questions must be considered when addressing the audience and the reader: Who will read the document? What is the reader's level of awareness about the subject? Is the reader familiar with the "language," jargon, special terms of the organization? Barnum and Carliner (1993) asserted that since workplace communication is "audience-based" not "writer-based," the writer must fully understand the reader.

The audience and purpose determine the content and form of the document. For example, in writing an executive summary, the most widely read section of workplace reports, the audience will include decision-makers -- managers and supervisors looking for bottom-line facts and figures. The statement of purpose or reason for writing the report, occurs early and alerts the audience to important results, conclusions, and recommendations. A clearly defined purpose gives both the reader and writer a sense of direction; writing to that purpose -- whether it is to informally persuade, recommend, offer alternatives, or summarize -- keeps the document unified and on target.

Clarity

Successful technical writing is clear, precise, and concise. There can be no misunderstandings about stated exact meanings, processes, directions or explanations. The main concern of the technical employee is to combine accurate, factual information into a clear, concise, and forceful prose style to produce a useful and readable text. This can be achieved through the use of simple vocabulary, clear sentence structure, words with single meaning (precise words to attain conciseness), and factual, concrete words. Readability can be achieved by avoiding empty words, pompous words, and repetition. Common empty words are found in phrases such as "for the purpose of" instead of "for" and "after this is accomplished" for "then." Graphs and charts also aid readers in clarifying or explaining textual information. In writing instructions, for example, graphs cannot replace text, but certainly clarify accompanying text. Headings that divide material into units or components often aid a reader's progress, especially busy readers in business and industry. Similarly, using numbered or bulleted lists calls attention to specific steps, allowing each step to stand out.

Grammar and Mechanical Review

Grammar is taught in grade school, high school, and college. Yet, many college juniors and seniors are deficient in grammar. Employers surveyed indicated that this deficiency is common among many entry level technical employees, resulting in poor quality written technical documents. Because we do not have time to review all areas of grammar in our course, we administer a comprehensive grammar/mechanical errors pretest on the following 15 areas:

1. Basic Sentence Patterns
2. Using Adjectives and Adverbs
3. Sentences with Modifiers
4. Pronoun Case
5. Using Independent Clauses
6. Pronoun Reference
7. Using Subordinate Clauses
8. Frequent Grammatical Errors: Modification, Parallelism, Comparison
9. Using Subordinate Phrases
10. Major Sentence Errors (fragment, comma-splice, run-on)
12. Problems with the comma
13. Subject Verb Agreement
14. Special Punctuation Use
15. Problems with Subjects and Verbs
16. Using Standard Punctuation

Students are required to study only areas in which they scored poorly and are then re-tested on those areas.

Business correspondence

Memos and letters are the most common forms of written communication and serve very important functions in an organization. Business communication can be defined as a "transfer" of information to help an organization achieve its goals and run smoothly (Andrews & Andrews, 1992, p. 16). The purpose of the memo, for instance, may be to inform, persuade, or record urgent and crucial information. The memo is an in-house document while the letter is an external document and is addressed to clients, customers, and others.

Because business and industry depend very heavily on business correspondence to function effectively and efficiently, the appropriate format, style, and tone ought to be employed when creating these documents. For example, the block and semi-block styles are the most popular format in letter writing. In communicating with clients and/or customers, a "friendly" impression should be created, using "please" and "thank you," using "you" more often than "I," and maintaining a "human" tone while avoiding being too blunt, especially in "bad" news or "refusal" letters. The bottom line is to keep business correspondence short, yet complete and to prevent needless exchange of letters. Houp, Pearsall and Tebeaux (1995) best sum up the four C's of effective business correspondence: be "clear, concise, complete, courteous" (p. 340).

Defining

One of the most fundamental skills of the technical writer is the ability to define terms clearly and to know when to define. The types of definition (parenthetical, sentence, extended) and the amount of information needed will depend entirely on the audience's needs. Definitions may be placed in the text itself, in footnotes, in the appendix or in a glossary. The placement of the definition will depend on the importance of the information to the reader. Many technical documents include a glossary of terms because of the technical and specialized nature of the documents as well as the varied background of the audience.

Executive Summaries

The part of a report most likely to be read by the decision-maker is the executive summary. Souther (1985) reported on how managers read reports and stated 100% of managers read the summary, 60% read the introduction, 50% read the conclusion, but only 15% read the entire body of the report and only 10% read appendices.

An executive summary presents the results, conclusions, and recommendations of a technical report. It is intended for upper management and meant for quick processing and should provide information for decision making. The executive summary is similar to an informative abstract and appears at the beginning of major workplace reports. The important difference between the abstract and the executive summary is that the executive summary is long enough to contain all bottom-line facts and figures useful in decision making. Students often need work on accurate, yet concise, summarizing and abstracting.

Incorporating Graphics

The November 1993 issue of Journal of the Society of Technical Communications is a special issue devoted entirely to visual communication. In line with "a picture is worth a thousand words," one graphic can often replace several paragraphs of prose. Computers can do impressive graphics, and supervisors expect to see more graphics in reports; also, they use the graphics to convince clients and customers of product quality. The four most common types of graphics are the flow chart, pie graph (or pie chart), bar chart (or histogram) and the line graph (or frequency polygon). Students need to know how to construct these and know how to use each appropriately. For example, the pie graph is used if a whole is divided into percentages. The bar chart is good to show comparison of several factors. The line graph shows the relationship between two factors: how a Y variable varies with an X factor. An important feature of good graphics is that they can stand alone with appropriate headings and labeling so that several paragraphs of prose are not necessary to

explain them. Graphics should also have clearly labeled titles, axes and columns.

Reports

Like correspondence, reports are an everyday affair in business and industry and serve various purposes, including recording the company's expenditures, profits/gains, reporting on the status of a project, etc. Reports studied in our technical writing class are instructional manuals, proposals, progress reports, feasibility reports and research reports. Each type of report generally follows specific guidelines depending on the individual organization and the type of report. However, all reports should be accessible to the readers and responsive to their needs and reading habits. To achieve readability and for effective delivery (for the busy executives), the report should have a complete table of contents, an executive summary, and clear headings and subheadings to divide the material into manageable units. Reports also should provide adequate white space between sections to allow readers to assimilate the information in one section before moving into another; group related ideas together to make reading easier; use underlining, capitalization, or bold face type to draw the reader's attention; and incorporate graphs or other illustrations to break up material and show important points at a glance. Hartley (1991) maintained that report writing is "action-oriented." The reader must "understand" the communication, "accept" it, and "react" favorably to it "at a glance" (p. 165). For the busy executive, time is of the essence.

Whether an organization's written communication relates to recertification, continued quality practices, specific written instructions, reports, or proposals, the challenge is to produce high-quality written documents with minimal effort in as little time as possible. One way to ensure document quality is to use appropriate rhetorical strategies as organizing principles. For example, when the writer's primary purpose is to inform, strategies such as chronological arrangement, topical arrangement, and classification or division may be used. A major application of chronology in technical writing is describing a process -- a sequence of steps from beginning to end resulting in a change or a product. Definition and description can help the reader understand complex terms, mechanisms, procedures and processes.

Instructional-Procedural Manual

A workplace document that plays a vital role in business and industry is instructional (procedural) manuals. Instructional manuals generally tell "how" to perform a task completely and accurately the first time. Now more than ever, there is a need to produce quality instructional manuals. Organizations that wish to obtain ISO 9000 Certification must produce quality assurance manuals that document policies, procedures, and processes. (ISO 9000 Certification is a quality assurance model that implements all aspects of an organizations structure, responsibilities, procedures and processes that affect the quality measure of the product).

The challenge lies in writing a document that is clear, concise, accurate, well-organized, and easy to follow. Steps in the work task must be identified correctly and written sequentially to ensure efficient execution. Imperative mood, active voice, listing and graphics are used. While there are no set organizational patterns to follow for developing an instructional manual, the following components are generally included: Introduction, Principle or Theory of Operation, List of Equipment and Materials, Sequence of Steps, and Trouble Shooting. Warnings and cautions should be inserted appropriately with white space surrounding them and be typed in larger print.

Progress Reports

In all types of organizations, management must stay informed of employees' work activities. An effective way of getting this timely information is via progress reports, also called "status reports" or "quarterly reports." Progress reports are generally written in a time-related report, answering questions such as "Is work on schedule?" and explaining reasons for lateness. Time-activity charts such as Gantt Charts are helpful to show, at a glance, what time period is needed to complete each activity. A line drawn at a certain point in time can quickly show activities completed and those yet to be completed.

Feasibility Reports

The feasibility report is based on a feasibility study which evaluates alternative solutions to an existing problem and recommends the most practical and feasible solution to the problem. The writer of a feasibility report must organize the report to reflect reading habits of managers and other executives, and use plain, straight-forward language, avoiding or defining technical jargon.

Proposal and Persuasion

When writing a proposal, the writer depends heavily on argumentation and persuasion to convince the reader to embrace his or her point of view. A feasibility report recommending the replacing of typewriters with personal computers or a memo arguing the purchase of a new laser printer for the department are examples of technical documents with an argumentative edge. To lend credibility to the argument, appeal should be made to reason, not to emotion, as appeal to emotion immediately makes a writer's case suspect. Technical arguments generally rely on facts to support conclusions.

Implications for Practice

Given that these writing concepts have been identified as important in the work world, a course in technical writing is highly recommended. Unfortunately, many community college technical programs have eliminated technical writing courses, focusing instead on English composition since it is transferable to a four-year college. Hence, students do not gain many of the much-needed skills in the topic areas previously listed. The following are suggestions and recommendations on how to incorporate some of these technical writing topics into the curriculum.

Collaboration of Composition and Technical Instructors

English Composition instructors can be encouraged to meet with technical instructors to develop writing assignments typical of the workplace. Many of these assignments would be just as useful to associate of arts or science students as technical students, because all students are preparing for the work world eventually. Technical instructors can require students to include a cover memo, an executive summary, flow charts, and graphics into their reports. These additional items are not very difficult to grade, and the exposure will enable students to develop very important and useful workplace skills. An in-service or seminar on incorporating applied or technical writing into the curriculum can be helpful.

Requirements of Students

Students can also be required to report data for different audiences and purposes. For example, in writing for the executive or customer, technical terms would need to be deleted, defined or described, and persuasive language may need to be used. All students should be encouraged to produce flawless documents, so good grammar should always be emphasized.

Encouragement of Students by Instructors

Instructors can encourage writing by having students write for particular contests in their fields. For example, construction technology students at our university are encouraged to participate in a report-writing contest sponsored by the Construction Institute. A lesson learned from most contests is that specific guidelines have to be followed, as is required in the work world.

Good writing skills can be the determining factor as to whether an employee will be retained or promoted. In another study by the authors, several managers interviewed indicated that they would not hire graduates who are deficient in communication skills. Good communication skills can be honed and taught and, it is our responsibility, as educators, to empower students and help them see the importance and application of these skills in the competitive global marketplace. Students who improve their communication skills are better prepared to contribute to the 21st century workforce.

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